ABSTRACT

IMAGE PROCESSING APPARATUS

In an image processing apparatus 20 an input sequence 130 of video images is processed to determine the different positions and orientations at which the

5   images were recorded in an efficient and accurate manner. A subset of the input images are selected as keyframes to form a sequence 250 of keyframes. Respective triples of keyframes having different, non-overlapping positions in the sequence 250 are selected and processed to determine the relative positions and orientations at which the keyframes in each triple were recorded to form

10   respective sets of keyframes. The positions and orientations of keyframes between the keyframes in each triple are then calculated to form expanded sets of keyframes 266, 276, 286. The sets are further expanded by calculating the positions and orientations of keyframes which lie between sets in the sequence 250. The sets are merged by calculating the relationship between the

15   coordinate systems in which the positions and orientations of the keyframes in each set are defined. During the processing, the positions and orientations calculated for keyframes in a set are adjusted to optimise the calculated solutions. This is performed in stages, considering at each stage a different window 270 of the keyframes and performing processing to minimise the error

20   associated with the keyframes in the window. The window is moved sequentially through the keyframes so that every keyframe in a set is considered at least once.

(FIGURE 3)